

“Tolerance will help to manage the risk of virus yellows but should be used alongside other measures.”

Virus tolerance makes debut

Roots Sugar beet varieties

The 2022 BBRO/BSPB Recommended List was released last month and features a high turnover of varieties – with six additions, including the first variety with a tolerance trait to virus yellowing. CPM finds out what to expect from the newcomers.

By Lucy de la Pasture

It's all change on the Recommended List (RL) with several old favourites becoming outclassed because they're falling behind the yields of the newer varieties. Daphna is now the oldest variety on the RL and only made its debut in 2017. With nearly twice as many varieties being removed (11) as added, the choice of RL varieties is slightly slimmed down for the next campaign.

The relatively high turnover rate for varieties is a trend that's likely to continue, believes Mike May, chairman of the RL board. "It reflects the rapid improvements in the yield potential of varieties by plant breeders and means inclusion of some of the older varieties can't be justified according to the current RL criteria, even

when they were reliable performers like Sabatina KWS and Haydn," he says.

KWS are first past the post in the race to bring forward genetics to tackle the virus yellows threat. The addition of Maruscha KWS, a variety with some tolerance to virus yellows, may provide a timely glimmer of hope for sugar beet growers after a season which showed just how devastating this disease can be.

Virus yellows trials

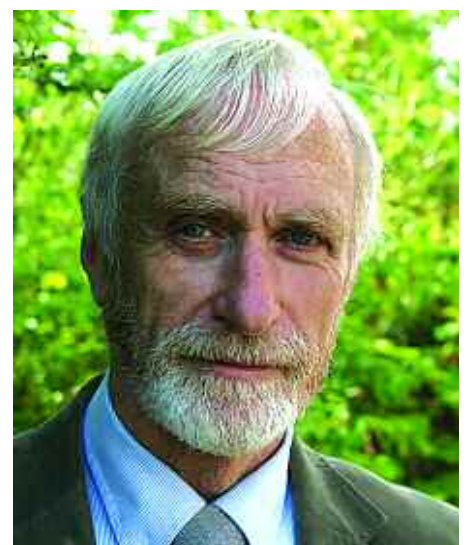
In the breeder's own virus yellows trials in East Anglia, Maruscha KWS has demonstrated partial tolerance to Beet Mild Yellowing Virus (BMV) over three years and a positive response to Beet Yellowing Virus (BYV) has also been noted, according to plant breeder KWS. These two forms of the virus complex have been found to inflict yield losses of up to 30% and 49% respectively.

Breeding varieties with strong tolerance remains a difficult and complicated process because of the different nature of the strains that make up the virus yellows complex, says Ben Bishop, KWS country manager for sugar beet in the UK.

BYV is a closterovirus whereas BMV and a third virus in the virus yellows complex, Beet Chlorosis Virus (BChV), are both poleroviruses. The distinct nature of the viruses involved in the disease means that tolerance to one form of the virus does not necessarily confer equal protection against another, he explains.

"Maruscha KWS is the first variety to come through the KWS breeding programme with a level of tolerance that supports commercially viable yields. It has recorded minimal losses to BMV infection and respectable losses to BYV when compared with those seen in susceptible varieties," he says.

It's expected that Maruscha KWS will be at the vanguard of a new generation of sugar beet varieties that will incorporate genetics that will help growers develop an integrated pest management approach to managing virus yellows but it's not a ▶



Mike May explains that some reliable performers have been outclassed by higher yielding varieties so have been removed from the RL for 2022.

Sugar beet varieties



Maruscha KWS is the first sugar beet variety with tolerance to one of the three viruses that cause virus yellows and is included in the new RL, says Ben Bishop.

▶ panacea, highlights Mike.

He adds that conventionally bred varieties are likely to only have good levels

of tolerance to one of the viruses in the virus yellow complex which means they won't prevent the problem in all situations. Last season the most damaging of the yellowing viruses was BYV.

"It's a good idea for growers to make a note of the virus that is most problematic on their own farm during the season. This information will help them select the variety with the best tolerance trait for their situation as new varieties with different tolerances to yellowing viruses are added to the RL over the next few years," suggests Mike.

He also highlights that new traits are initially associated with a yield lag and Maruscha is no exception, yielding an average of 93.3% of controls in three years of RL trials.

KWS will have a series of demonstration plots in commercial crops of sugar beet in the 2021 season, so those interested will have the opportunity to see how the trait performs under real-world conditions this summer, coronavirus restrictions permitting, adds Ben.

The introduction of varieties with tolerance to yellowing viruses represents an opportunity to protect yields but exploiting this possibility will also involve the continued use of cultural measures, such as good field hygiene, he highlights.

"Maruscha KWS shouldn't be thought of as the sole solution to virus yellows. Its tolerance, and that of other varieties as they're introduced, will help to manage the risk of virus yellows but should be used



BTS 3020 offers high yield (102.2%) and good bolting resistance as an earlier sowing option.

Prime fodder beet seed for success

The late-drilling slot could be the answer to unlocking the benefits of primed fodder beet seed, believes Agrovista agronomist and trials manager, Steven Gate.

Following the recent unpredictable UK weather patterns, which have included three consecutive dry springs, he confirms that the trials work looking into the advantages of primed fodder beet seed has so far proved to be inconclusive.

"It has been very frustrating. We know there are undoubted benefits to using primed seed, based on extensive trial work in France and from replicated trials in the UK from breeder Elsoms Seeds."

But an unusual combination of dry and cold conditions has led to false starts in germination at the Agrovista trials site at Brackenburgh Estate, near Penrith in Cumbria, he explains.

"If these very dry springs become a more permanent feature of our weather then conserving moisture prior to drilling fodder beet is going to be critical for growers in the future.

"Primed seed potentially brings a host of advantages to UK farmers — including more even establishment; faster germination, which ensures young fodder beet plants become more competitive; and helps the developing fodder beet crop overcome problems such as virus yellows, which posed a significant problem for UK growers in 2020.

"On the basis of the positive results we achieved from a primed seed crop drilled in May

2020, which both established and yielded well with no signs of virus yellows, there's new evidence which suggests a later drilling slot could be the missing link to unlocking more benefits from primed seed," he says.

During this year's trials work will be expanding in this area to investigate late drilling more before sharing data with customers and suppliers, he adds.

"In fodder beet trials using conventional seed, Cagnotte (from breeder Florimond Desprez) continues to set the standard and was consistently yielding 12% ahead of the next best variety last year. A major plus for growers is its conical shape and smooth surface, which enables a cleaner lift with a low dirt tare," says Steven.

Henrietta Wells, energy and forage crop manager at Elsoms, sees priming as a potential game changer for growers, based on UK replicated trials that have shown a yield increase using primed material.

"Primed seed germinates quicker, enabling young fodder beet plants to become more resilient to climatic conditions, insects and diseases. It also helps achieve even establishment and uniform sized beet ensures increased efficiency with agronomic passes, including chemical applications that can be more tailored to the crop.

"With current and future legislative pressure on use of chemicals, any new tool — such as priming — that can help make young crops more resilient to pests and diseases has to be



Priming the seed could unlock the potential of late-drilled fodder beet, says Steven Gates.

of importance to growers," she says.

"Elsoms currently have a portfolio of eight fodder beet varieties, all offering unique selling points and a place in any farming system. Whilst Jamon is currently the biggest selling and most popular variety, Cagnotte — a high yielding, rhizomania resistant variety with high dry matter — has performed exceptionally well in UK trials, as Steven highlighted. For the 2021 season we will also have primed Cagnotte seed available to the UK market.

"Brunium will be commercially available to fodder beet growers for the first time this year, with limited seed availability. Brunium is rhizomania tolerant, with a conical root shape, and provides a high energy feed that suits any farming system. This variety offers all the existing benefits of Jamon and presents a highly palatable feed for both cattle and sheep," concludes Henrietta.



With the highest sugar content on the RL, BTS 5570 also illustrates how sugar beet breeders are raising the bar when it comes to breeding for disease resistance, says Ron Granger.

alongside other measures such as controlling volunteers on spoil heaps as part of an integrated strategy. Good field hygiene is the basis to controlling virus and disease across all crops and this applies equally to sugar beet.”

Another newcomer from the same stable is Katjana KWS. It's the second highest yielding on the RL, with an adjusted yield of 102.7% of controls, and is also tolerant to beet cyst nematode (BCN) with low-bolting characteristics.

The Conviso Smart breeding programme continues to evolve, with another ALS-tolerant variety added to the RL for 2022, with a yield of 92.2% of controls in RL trials using conventional herbicides.

“Smart Rixta KWS is a good fit to this system, with low bolting when sown in the main drilling window and an adjusted yield close to the average of control when it's grown using the Conviso Smart system,” says Ben.

Limagrain adds another two varieties to join yield front-runner BTS 1915 (107.3%) on the RL — BTS 5570 has the highest sugar content and BTS 3020 offers high yield (102.2%) and good bolting resistance as an earlier sowing option. Both varieties are rhizomania resistant.

“Sitting amongst the pack for highest yields (101.5%), BTS 5570 offers flexibility in drilling, showing low levels of early sown and normal sown bolters,” says Ron Granger, arable technical manager for Limagrain UK.

“BTS 5570's robust disease resistance profile illustrates how sugar beet breeders are raising the bar when it comes to breeding for disease resistance,” he points out.

“The variety has an 8.1 rating for rust,

5.2 for powdery mildew and the available, limited data from both Betaseed trials and the RL trials, suggests it has better than average cercospora resistance.”

BTS 3020 is the early bird variety within the Limagrain portfolio having consistently delivered three years of very low counts in the early sowing period before 5 March. “This result has been consistent over the past three years, including data from 2020 which we know was a higher year for bolting.

Latest innovation

Wren is the latest innovation from SESVanderhave — a variety that has been developed and tested under UK conditions and tailored to the needs of Britain's sugar beet growers, says the company's UK managing director, Ian Munnery.

“UK growers face the twin challenges of an uncertain market and variable weather patterns every season. Having invested in more than 25,000 trial plots each year in the UK over the 10 years it takes with conventional breeding to bring a new variety to market, we're confident that it will perform consistently well regardless of what the environment throws at it.”

That's been born out in the RL trials where it has performed consistently, including the tough 2020 season where Wren was in the top four varieties for yield (101.7%).

“Wren stands out for its strong establishment and this, together with a low bolting score in early sowing trials, makes Wren a dependable choice for farmers who wish to make full use of the season by sowing early to exploit mature plant resistance as part of their strategy to combat virus yellows. At the same time,



Wren stands out for its high establishment and can be sown early, enabling growers to make use of mature plant resistance to virus yellows, says Ian Munnery.

it will perform well sown later in the season,” says Ian.

With effective disease tolerance, Wren is a good all-round performer that will make a good contribution to a farm's variety mix, he adds.

Whether varieties should be considered on their wider merits and less emphasis put on yield is something that will be considered as the RL selection guidelines are reviewed this year, the results of which will be applied to the selection process in 2023.

Dr Vicky Foster, head of BBRO, says now is the right time to assess whether the RL is supplying growers with the right information. “Variety decisions should be made on profitability which means not just yield but the costs of production need to be taken into account. The RL trials cost £250K each year so we have to make sure we're delivering value for levy-payers money.” ■

BBRO/BSPB RL additions for 2022						
	Katjana KWS	BTS3020	Wren	BTS5770	Maruscha KWS	Smart Rixta KWS
Traits	BCN			Virus		
Adj tonnes (% mean of control)	102.7	102.2	101.7	101.5	93.5	92.2
Sugar Yield (% mean of control)	102.7	102.2	101.7	101.5	93.5	92.2
Root Yield (% mean of control)	101.6	100.2	104.5	98.2	91.6	91.3
Sugar Content (%)	17.2	17.4	16.6	17.6	17.4	17.2
Early-sown bolters (on or before 05 March) <small>X = not suitable for early drilling</small>	1,630	675	2,532	968	7,204 X	3,335 X
Normal-sown bolters	0	14	23	0	0	14
Establishment	99.7	101.1	102.2	101.9	96.7	101.9
Rust (resistance rating)	3.9	7.5	6.2	8.1	6.0	4.2
Powdery Mildew (resistance rating)	5.3	4.6	4.9	5.2	3.0	4.6
Cercospora (% leaf infection)	2	1	1	1	0	2

Source: BBRO, 2021